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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Vandermeer, J.

SERIAL NO. 10/005881

FILED: November 8, 2001

FOR: Investment Casting Mold and
Method of Manufacture

Art Unit: To be assigned

Examiner: To be assigned

Assistant Commissioner for Patents
Alexandria, VA 22314

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PETITION TO MAKE SPECIAL UNDER 37 CFR 1.102

Introduction

Applicant petitions to have the above-identified application be advanced out of turn for examination and be treated as special throughout its entire prosecution. Grant of this petition will facilitate early examination and allowance to enable the assignee of this application to stop a major competitor from infringing at least one claim, such as, claim 21, of the above-identified application.

A check in the amount of \$130 which represents the required petition fee under 37 CFR 1.17(h) is attached.

Application Claims

The application recites method claims which relate to manufacture of investment cast molds. In particular, claim 21 relates to a method of mixing fiber with refractory filler material to produce a dry blend. The dry blend is mixed with a colloidal silica binder to form a ceramic slurry. The slurry than is coated onto an expendable pattern to produce an investment casting mold. The method of claim 21 which uses the claimed ceramic dry blend achieve excellent flow and coating characteristics. Claim 21 is reproduced below:

21. A method of manufacture of an investment casting mold comprising,
mixing a fiber and refractory filler to form a first dry blend,
 mixing fiber and refractory filler to form a second dry blend which may be the same or different from the first dry blend,
 mixing the first dry blend with an aqueous colloidal silica sol to form a refractory prime coat slurry,
 mixing the second dry blend with an aqueous colloidal silica sol to form a refractory back-up coat slurry which may be the same or different from the refractory prime coat slurry,
 applying a coating of the prime coat slurry onto an expendable pattern of thermoplastic material to produce a prime coated preform,
 applying a stucco of refractory material onto the prime coated preform,
 drying the stuccoed, prime coated preform,
 applying a coating of the refractory back-up coat slurry onto the stuccoed, prime coated preform to produce a refractory back-up coated preform,
 applying a stucco of refractory material onto the back-up coated preform to produce a stuccoed, back-up coated preform,
 drying the stuccoed, refractory back-up coated preform,
 removing the expendable pattern from the refractory back-up coated preform to produce a green shell mold, and
 heating the green shell mold to a temperature sufficient to produce a fired ceramic shell mold.

Patentability of claim 21

Applicant has performed a prior art search. The patents identified in this search are listed below. A copy of each of these patents is enclosed. Applicant respectfully submits that none of the references, taken alone or in any combination, either teaches or suggests claim 21. A discussion of the patentability of claim 21 over the references

discovered in the art search is given below:

1. UK Patent 2,350,810B is directed to investment casting. The process of the UK patent entails mixing a binder and a refractory material to produce a mixture. Organic fibers are added to the mixture to produce a slurry. The slurry then is coated onto a pattern and allowed to dry on the pattern to form a shell.

The UK patent fails to either teach or suggest the claimed step of forming a dry blend of refractory material and fiber, and mixing that dry blend with a binder such as an aqueous colloidal silica sol. Indeed, the UK patent is silent as to this claimed step. One of ordinary skill, given the instruction of the UK patent to mix each of fiber and refractory material with a binder such as an aqueous colloidal silica sol to form a slurry, would not be motivated to achieve the claimed invention wherein a dry blend of the refractory material and fiber is first formed, and that blend is then added to a binder such as a colloidal silica sol.

2. UK Patent 1,410,634 teaches compositions for use in a method of manufacture of investment shell molds. The method entails immersing a disposable pattern into a slurry of refractory particulate, binder, liquid and fibers. The coated pattern is removed from the slurry and dried to produce a coating on the pattern.

This patent is silent as to applicants claimed step of forming a dry blend of fiber and refractory filler, and then mixing that dry blend with an aqueous colloidal silica sol to form a ceramic slurry. One of ordinary skill, therefore, given this patent, would not be motivated to achieve claimed method wherein the claimed blend is employed.

3. US Pat. 4989664(Roth) teaches a ceramic core molding composition which includes ceramic fibers and ceramic particulates. The composition is used to produce a molded ceramic core.

Roth is silent as to applicants claimed step of forming a dry blend of fiber and refractory filler and then mixing that dry blend with an aqueous colloidal silica sol to form a ceramic slurry. One of ordinary skill, therefore, given Roth, would not be motivated to achieve the claimed invention wherein the claimed blend is employed.

4. US Pat. 4998581(Lane et al.) is directed to a reinforced ceramic investment casting shell mold. The mold is produced by dipping a pattern into a ceramic slurry to produce a coated pattern. Ceramic stucco then is applied to the coating. Fibrous reinforcement is placed around the mold

and the shell mold is built up to the desired overall thickness by repeating the dipping and applying steps over the reinforcing fibrous material. The ceramic slurry which is employed as the coating includes a ceramic material such as silica, alumina or zirconia.

Lane et al. is silent as to applicants claimed step of forming a dry blend of fiber and refractory filler and then mixing that dry blend with an aqueous colloidal silica sol to form a ceramic slurry. One of ordinary skill, therefore, given Lane et al. would not be motivated to achieve the claimed method wherein the claimed blend is employed.

5. US Pat. 5113925 (Cook) shows a method of producing a metal matrix composite. The method entails forming a mixture of a liquid medium, binding agent and a reinforcement into a preform. The mixture includes a liquid medium such as wax or water, a ceramic reinforcement material, and a binder. The preform is encased in an investment material. The preform then is heated to remove the liquid component of the mixture. The remaining reinforcement material and binder in the preform is sintered. Molten metal then is forced under pressure into the sintered preform.

Cook is silent as to applicants claimed step of forming a mixture of fiber and refractory filler to form a dry blend, and then mixing that dry blend with a colloidal silica sol to form a refractory slurry. One of ordinary skill, therefore, given Cook, would not be motivated to achieve the claimed blend and the claimed method wherein the claimed blend is employed.

6. US Pat. 5712435 (Feagin) teaches a slurry that contains yttria as the main component. Additional finely divided refractory can be blended with the yttria.

Feagin is silent as to applicants claimed blend, and the use of that blend in a ceramic slurry. One of ordinary skill, therefore, given Feagin, would not be motivated to achieve the claimed blend and to achieve the claimed method wherein the claimed blend is employed.

All of the references identified in the art search fail to teach or suggest the claimed blend, or the use of the claimed blend. None of these references, taken alone or in combination, would motivate one skilled in the art to produce the claimed ceramic dry blend and use it as in the claimed method. None of the identified references, moreover, recognize the advantages achieved by the claimed method. Indeed, each of

the reference's instruction to add fiber to a premixed slurry of colloidal silica sol and filler would be expected to disadvantageously cause the added fibers to float on the surface of the slurry. Formulation of the claimed dry blend of refractory filler and fiber, and the use of that dry blend as in the claimed method, however, advantageously overcomes the difficulties of the prior art.

In view of the differences between the references cited in the art search, applicant respectfully submits that this application includes patentable subject matter.

Competitors Activities

A major competitor of the assignee of the above-identified application sells dry ceramic blends for use in manufacture of investment casting molds. The competitor's dry ceramic blends are marketed to end users in the investment casting industry--the same industry to which the above-identified application is directed.

The assignee has obtained a sample of the competitors dry blend. Analysis of the blend by the University of Birmingham in the U.K. shows that the dry blend includes refractory material and fiber, namely, fused silica and polyester fiber. This analysis shows that the competitor's dry blend includes the components employed in Applicants claimed blend of fiber and refractory filler.

The competitor, in addition to selling a blend within the scope of applicants claimed dry blend, encourages its customers to mix the competitor's dry blend with a colloidal silica binder to form a "ceramic slurry" for use in manufacture of investment casting molds.

The claimed dry blend of fiber and refractory material marketed by the competitor does not have any substantial commercial use beyond manufacture of investment casting molds.

Contributory infringement

Contributory infringement is defined at 35 U.S.C. 271.(c):

“Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer. “

Section 271(c) makes clear that only proof of the competitors knowledge that its activity causes an infringement is necessary to show contributory infringement. The intent to infringe can be presumed where the product sold by the infringer has no substantial non-infringing use. See, e.g., *Henry v. A.B. Dick*, 224 U.S. at 48.

Here, the competitor, when made aware of applicants patent issued on the above-identified application, would recognize that its ceramic dry blend is within the scope of applicants claimed dry blend. This would be apparent from Table I.

Table 1	
Claim 21	Competitor
Blend of fiber and refractory filler	Blend of polyester fiber and fused silica

Table 1 shows that the blend sold by the competitor is within the scope of the claimed blend recited in claim 21.

As mentioned above, the ceramic dry blend sold by the competitor does not have any substantial non-infringing use other than in manufacture of investment casting shell molds. Indeed, the blend sold by the competitor appears *especially adapted* for use in manufacture of investment casting molds. The intent to infringe therefore can be presumed. *Henry v. A.B. Dick*, 224 U.S. at 48.

The fact that the competitors dry blend is within the scope of applicants claimed dry blend, together with the absence of any substantial noninfringing use of the competitors dry blend, makes it very likely that a properly informed court would hold that the use of the competitor's blend in manufacture of investment casting molds constitutes contributory infringement of claim 21.

Inducement of Infringement

The competitors sales of its ceramic dry blend to investment casting manufacturers would also constitute inducement of infringement of Claim 21 under 35 U.S.C. 271(b). The Federal Circuit, in *Manville Sales Corp. v. Paramount Systems*, 917 F.2d 544, 553, 16 U.S.P.Q.2D (BNA) 1587, 1594 (Fed. Cir. 1990), explained that inducement of infringement occurs when the competitor knew or should have known that his actions would induce actual infringement.

As discussed above, the dry ceramic blend sold by the competitor appears specifically directed to investment casting mold manufacture, and does not have any substantial noninfringing use. A properly informed court therefore likely would conclude that the competitor knew or should have known that the use of its blend by an end user to manufacture investment casting molds would induce infringement of, e.g., claim 21 by that end user.

Relief Sought

Applicant seeks to have this application advanced out of turn for examination. Grant of this petition will enable the Assignee to take necessary steps as soon as possible to terminate its competitors infringing activities.

Grant of this petition is respectfully requested.

Respectfully submitted,



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